

## The blue butterflies of the genus *Agrodiaetus* HÜBNER (Lep., Lycaenidae) : Symptoms of taxonomic confusion

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In order to identify members of this difficult group of butterflies, one has to rely mainly on FORSTER's articles on the classification of the blue members of the genus *Agrodiaetus* (1956, 1960, 1961). Unfortunately FORSTER used superficial characters as a main criterion for establishing the level of relationship between the various blue *Agrodiaetus* taxa and omitted structural characters, submitting to the general notion that these are unreliable in this genus (HIGGINS, 1975).

DE LESSE's contribution to the problem (1957, 1959a-f, 1960, 1961, 1962a & b, 1963a-c), based almost exclusively on chromosome counts, helped to settle a good number of taxonomic issues and to establish a degree of order in the classification of members of the group. Unfortunately, however, chromosome counts are extremely difficult to obtain and where these are being used as the sole means for sound classification judgment, it is evident that the whole process becomes the privilege of the few. Furthermore, when one is dealing with taxa exhibiting minor superficial differences and having the same chromosome number, both being conditions pointing to conspecificity, one may be led to erroneous taxonomic judgment if, as may very well be the case, there also exist structural differences that have not been taken into consideration.

The generally accepted opinion that the genitalia of these blues are unreliable for classification, stems from the fact that they do not always exhibit pronounced, easy-to-track differences. Mounting practices, resulting in distorted and limited views of these appendages have resulted in confounding the issues even further.

The correct approach when studying genitalia is to view and draw them while they are being kept immersed in 80% alcohol, free from the distortion that results from mounting them onto slides under pressure. In doing so it is imperative that all views of the armatures be studied and drawn. The results from this approach can be quite revealing, as can readily be seen from the examples that follow.

During a recent visit to the British Museum (Natural History) in London, I was kindly granted permission to dissect and examine the genitalia of a single male and two female *Agrodiaetus iphigenia iphidamon* STAUDINGER 1899, from Iran (Figs. 1, 3, 4 & 5, example *d*; Figs. 7, example *o*), as well as of two male and a single female *Agrodiaetus iphigenia iphigenides* STAUDINGER 1886 (Figs. 1, 3, 4 & 5, example *e*; Fig. 7, example *p*), of a single male *Agrodiaetus iphigenia rueckbeili* FORSTER 1960 (Figs. 1, 3, 4 & 5, example *f*) and of a single male *Agrodiaetus iphigenia juldusa* STAUDINGER 1886 (Figs. 1, 3, 4 & 5, example *g*), all from Turkestan.

All these specimens appeared superficially typical of the various subspecies they were assigned to and agreed well with FORSTER's additional descriptive information and figures (FORSTER, 1960). Their genitalia, however, differed to such an extent from those of nominate *iphigenia* HERRICH-SCHÄFFER 1847 (Figs. 1, 3, 4 & 5, example *a*; Fig. 7, example *m*), of *iphigenia araratensis* DE LESSE 1957 (Figs. 1, 3, 4 & 5, example *b*) and of *iphigenia nonacriensis* BROWN 1977 (Figs. 1, 3, 4 & 5, example *c*; Fig. 7, example *n*), all three of which have similar genitalia between them and are superficially very close to each other, that conspecificity with *iphigenia* had to be ruled out.

The taxon *iphidamon*, superficially close to *iphigenia* and the taxa *iphigenides* and *rueckbeili*, superficially different from *iphigenia*, were found to have male genitalia with considerably longer Valvae than does *iphigenia* and differently shaped Labides when viewed laterally, these being slenderer than in *iphigenia* and lacking the dorsal extension present in the latter. The female genitalia of *iphidamon* and *iphigenides* were found to be identical with each other, but to differ from those of *iphigenia* by the presence of a sclerotized area near the distal end of the eversible Henia (a feature which is lacking in *iphigenia*), and by the shape of the heavily sclerotized Ostial Plate, which is oblong with straight ends in the former two taxa, whereas in *iphigenia* these ends point basal. It would therefore appear that *iphidamon*, *iphigenides* and *rueckbeili* are specifically distinct from *iphigenia* and should not be placed as subspecies of the latter.

The taxon *juldusa*, superficially different from *iphigenia*, was found to differ structurally from it in the male genitalia by the shape and size of the Labides, which, when viewed laterally, lack the dorsal extension present in those of *iphigenia* and are more slender than in the latter. This likewise suggests that *juldusa* is specifically distinct from *iphigenia* and not, as previously considered, a subspecies of it.

Furthermore, male *juldusa* has decidedly shorter Valvae than the superficially different and allopatric *iphidamon* and *rueckbeili*, as well as the superficially different and sympatric *iphigenides* (the two taxa have overlapping geogra-

phic ranges), suggesting that this taxon is specifically distinct from the other three.

The taxonomic relationship between *iphidamon*, *iphigenides* and *rueckbeili* cannot be settled on the basis of their genitalia alone, as they do not seem to offer good diagnostic features for separating them from each other. The rather smaller size of the figured Valva of *rueckbeili* could very well be due to the smaller size of the insect per se (FW length : *iphidamon*, 1.70 cm ; *iphigenides* 1.70 cm ; *rueckbeili*, 1.59 cm). It is quite probable that on the whole the size of the Valva of *rueckbeili* falls within the size range of the Valvae of *iphidamon* and *iphigenides*. A safe conclusion to this hypothesis would require the study of a large number of genitalia of these three taxa.

The existence, however, of ample superficial differences between *iphidamon*, *iphigenides* and *rueckbeili* suggests that they probably represent three distinct specific entities. In the case of *iphigenides* and *rueckbeili* in particular, we are also confronted with overlapping geographic ranges, suggesting sympatry and leaving no doubt as to their specific separation.

It is interesting to note that the genitalia of *iphidamon*, *iphigenides*, *rueckbeili* and *juldusa* bear closer affinities to those of the superficially distinct *Agrodiaetus damone* EVERS-MANN 1841 (Figs. 2, 3, 4 & 6, examples *i* & *j*; Fig. 7, example *q*) than they do to those of *iphigenia*, thus revealing a greater degree of separation of these four taxa from *iphigenia* than would otherwise appear.

It is suggested that the following taxonomic arrangement be used for the taxa *iphigenia*, *araratensis*, *nonacriensis*, *iphidamon*, *iphigenides*, *rueckbeili* and *juldusa* :

*Agrodiaetus iphigenia iphigenia* HERRICH-SCHÄFFER 1847 (Unchanged) ;  
*Agrodiaetus iphigenia araratensis* DE LESSE 1957 (Unchanged) ; *Agrodiaetus iphigenia nonacriensis* BROWN 1977 (Unchanged) ; *Agrodiaetus iphidamon* STAUDINGER 1899 (In place of *Agrodiaetus iphigenia iphidamon*) ; *Agrodiaetus iphigenides* STAUDINGER 1886 (In place of *Agrodiaetus iphigenia iphigenides*) ; *Agrodiaetus rueckbeili* FORSTER 1960 (In place of *Agrodiaetus iphigenia rueckbeili*) ; *Agrodiaetus juldusa* STAUDINGER 1886 (In place of *Agrodiaetus iphigenia juldusa*).

Example *h* in Figs. 2, 3, 4 & 6 are the genitalia of a male specimen taken from the B.M. (N.H.), labeled *Agrodiaetus altivagans* FORSTER 1956. The specimen bore no data other than it was from LEDERER, coll. ZELLER. Superficially it agreed almost precisely with FORSTER's detailed original description for this taxon and the accompanying plate, leaving almost no doubt as to its correct identification. Furthermore, its genitalia proved different from those of *damone* (Figs. 2, 3, 4 & 6, example *i* & *j*), by the much shorter Valvae.

Fig. 1

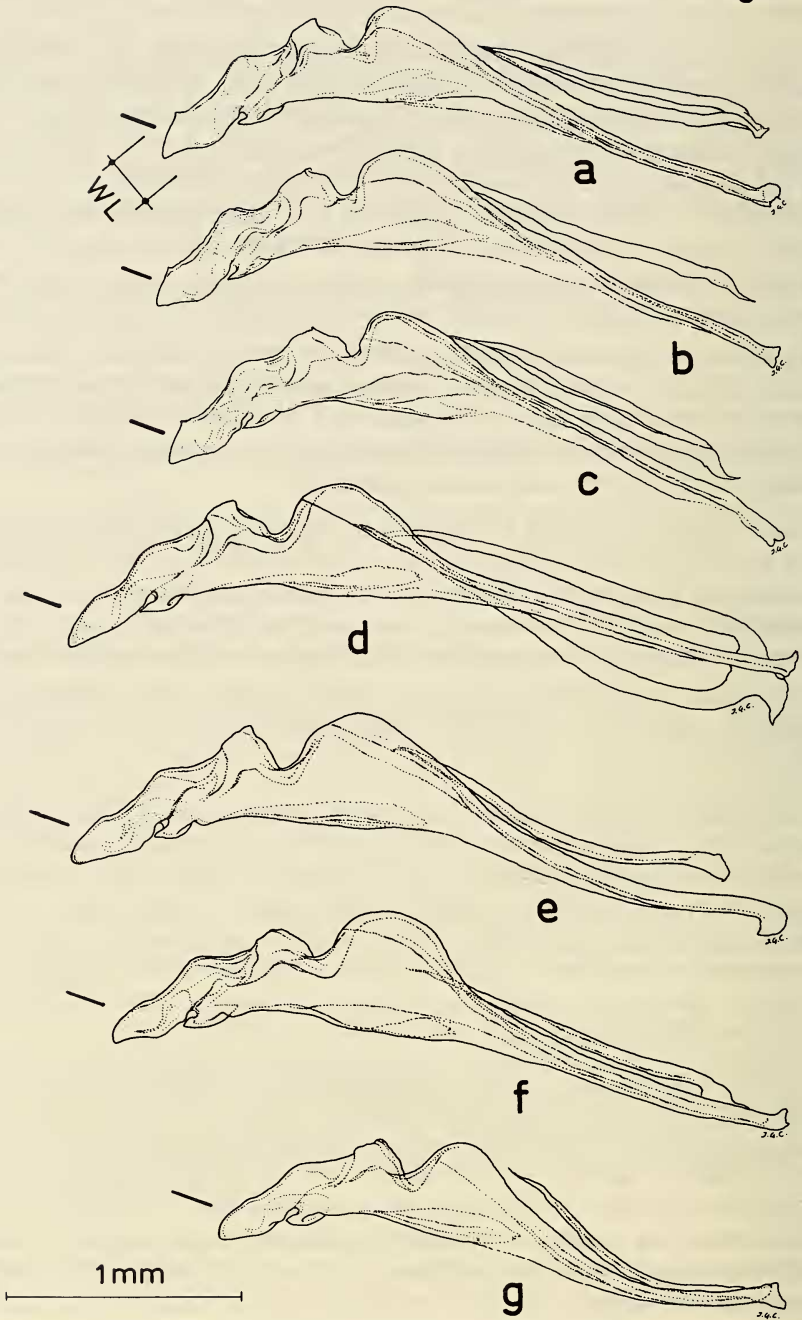


Fig. 1 & 2. Lateral view of right side of male genital armature. Valvae and Penis removed ; Setae omitted.

Fig. 2

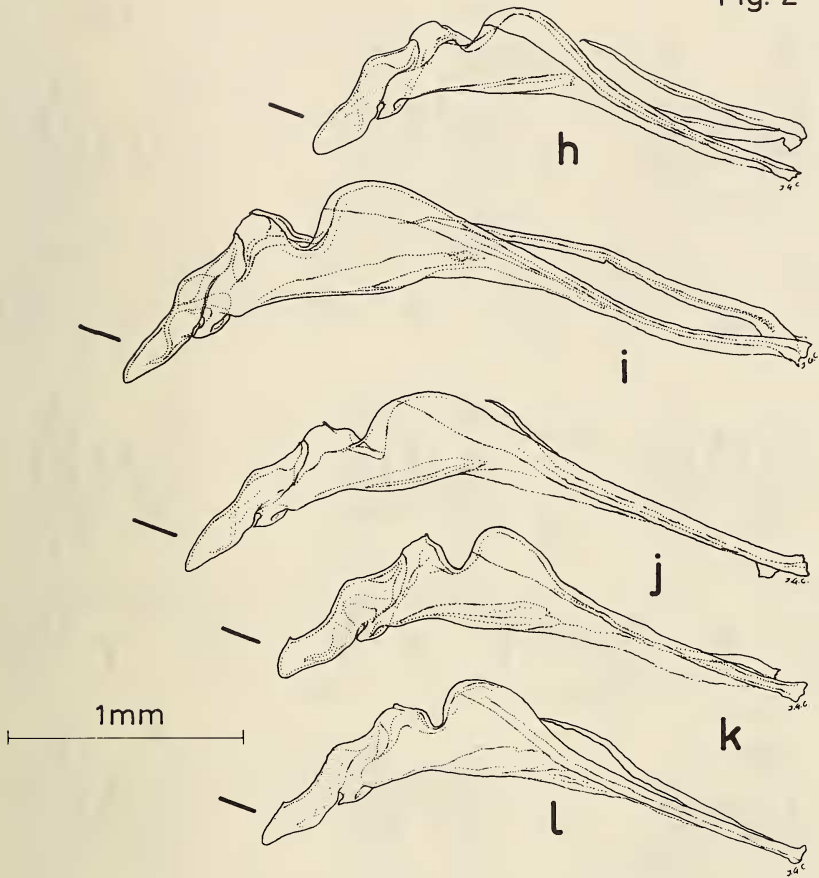


Fig. 3

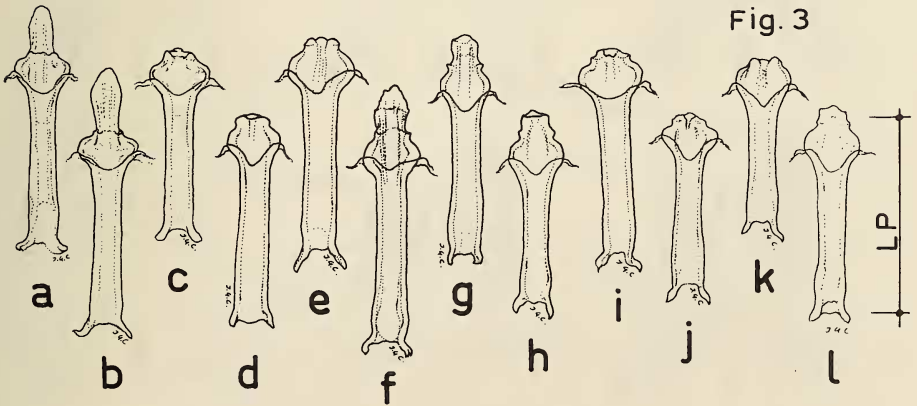


Fig. 3. Ventral view of Penis.

Fig.4

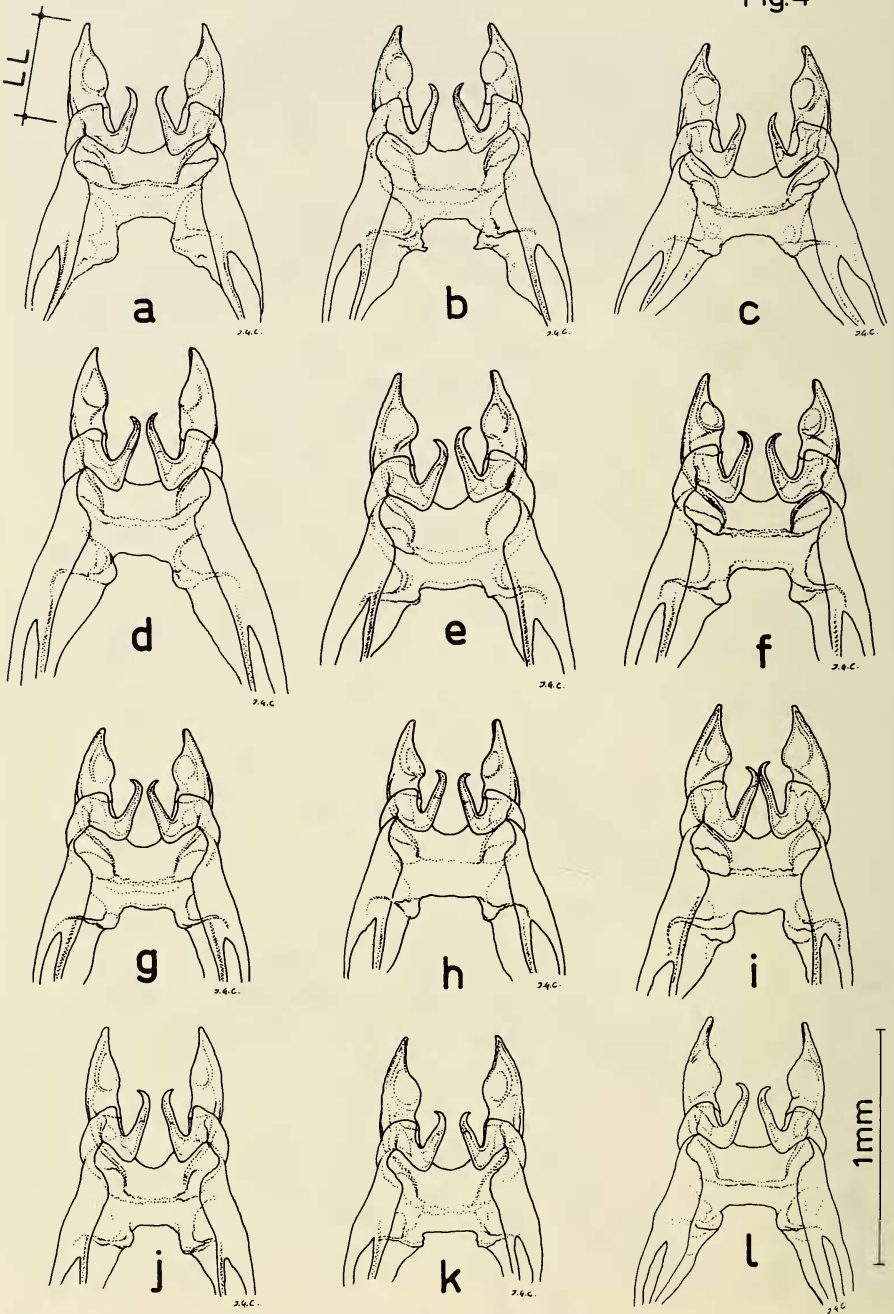


Fig. 4. Ventral view of Labides, Falces, Tegumen and portion of Vinculum. Setae omitted.

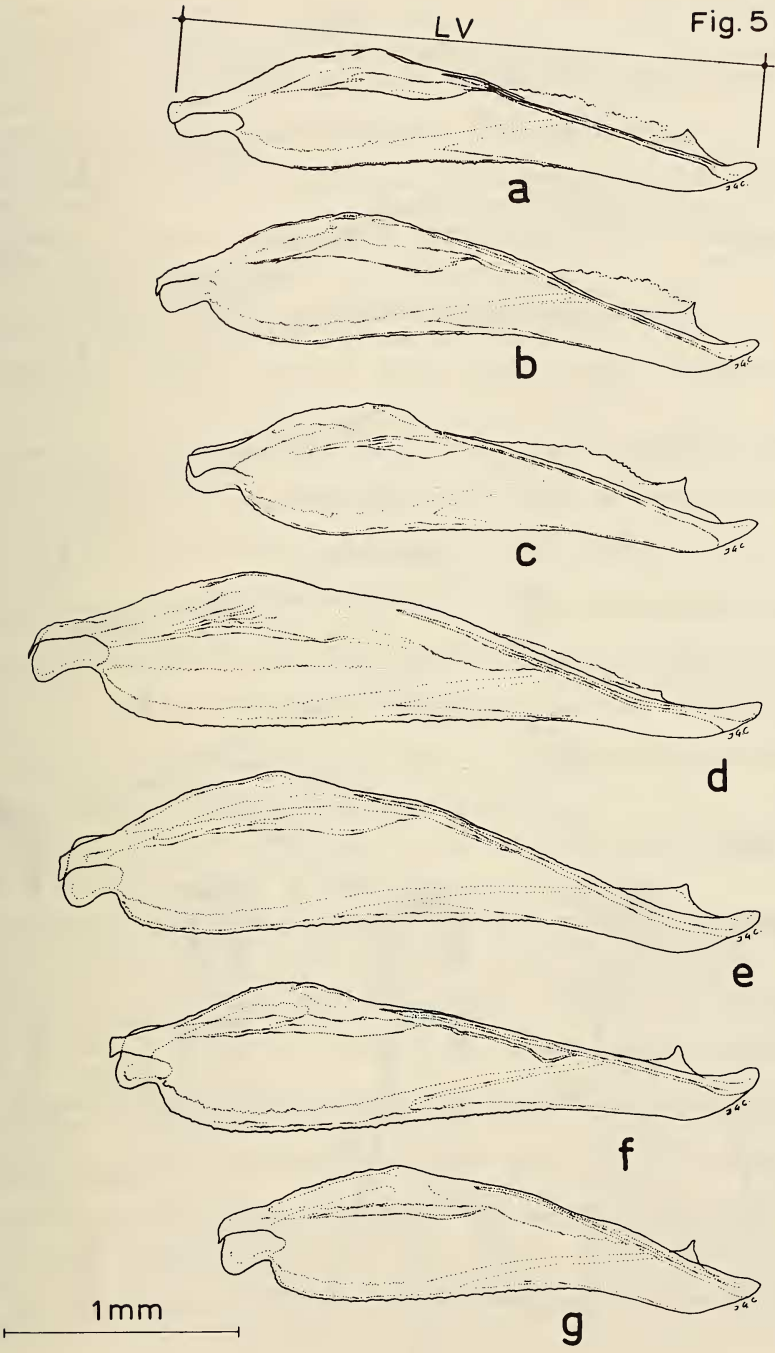


Fig. 5 & 6. Lateral view of exterior face of right Valva. Setae omitted.

Fig. 6

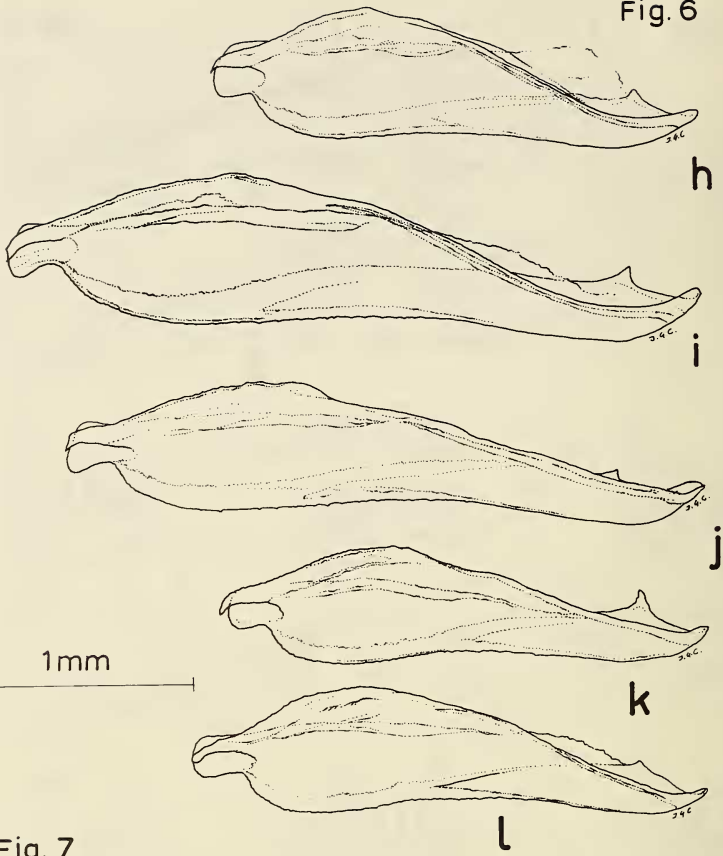


Fig. 7

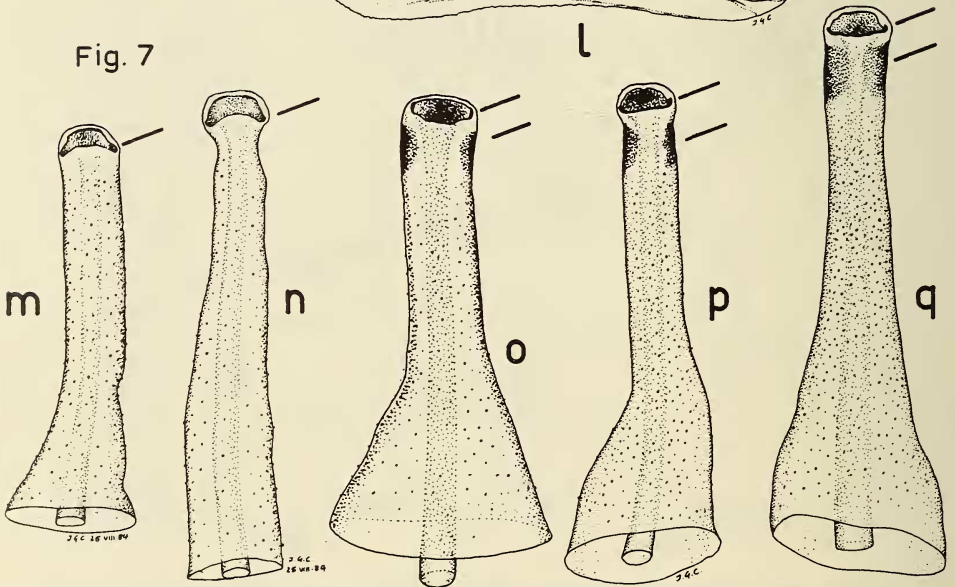


Fig. 7. Dorsal view of Henia.



- a. *Agrodiaetus iphigenia iphigenia* HERRICH-SCHÄFFER. Male. Turkey, Konya, Sultandaglari, 15 km of Aksehir, 1500 m, 16/19.vii.1980.  
Length of valva, LV = 2.45 mm ; Length of Labides, LL = 0.42 mm ; Width of Labides, WL = 0.21 mm ; Length of Penis, LP = 0.80 mm (Fully everted Vesica not taken into account).
- b. *Agrodiaetus iphigenia araratensis* DE LESSE. Male. Turkey, Kars, 8 km W. of Kazikoporan, 2200-2500 m, 16/21.vii.1977.  
LV = 2.57 mm ; LL = 0.38 mm ; WL = 0.20 mm ; LP = 0.84 mm (Fully everted Vesica not taken into account).
- c. *Agrodiaetus iphigenia nonacriensis* BROWN. Male. Greece, Mts of N. Peloponnissos, 1600 m, 13.vii.1978.  
LV = 2.44 mm ; LL = 0.38 mm ; WL = 0.20 mm ; LP = 0.76 mm.
- d. *Agrodiaetus iphidamon* STAUDINGER. Male. Iran, Shahkuh. Coll. B.M.(N.H.).  
LV = 3.06 mm ; LL = 0.40 mm ; WL = 0.15 mm ; LP = 0.88 mm.
- e. *Agrodiaetus iphigenides* STAUDINGER. Male. Turkestan, Kappak, Alexander Mts. 10/14.vii.1905. Coll. B.M.(N.H.).  
LV = 2.94 mm ; LL = 0.45 mm ; WL = 0.18 mm ; LP = 0.91 mm.
- f. *Agrodiaetus rueckbeili* FORSTER. Male. Turkestan, Turgan, Ak-su, Tian Shan. 20.vii.1905, Coll. B.M.(N.H.).  
LV = 2.70 mm ; LL = 0.39 mm ; WL = 0.16 mm ; LP = 0.90 mm (Partly everted Vesica not taken into account).
- g. *Agrodiaetus juldusa* STAUDINGER. Male. Turkestan, Tian Shan, Juldus, 12.vii.1879. Coll. B.M.(N.H.).  
LV = 2.28 mm ; LL = 0.36 mm ; WL = 0.16 mm ; LP = 0.83 mm (Partly everted Vesica not taken into account).
- h. *Agrodiaetus altivagans* FORSTER. Male. LEDERER, Coll. ZELLER. No other data. Coll. B.M.(N.H.).  
LV = 2.05 mm ; LL = 0.37 mm ; WL = 0.16 mm ; LP = 0.75 mm (Partly everted Vesica not taken into account).
- i. *Agrodiaetus damone sibirica* STAUDINGER. Male. Siberia, Ongodai, Altai Mts. 3-5000ft., 12.vii.1898. Coll. B.M.(N.H.).  
LV = 2.94 mm ; LL = 0.47 mm ; WL = 0.14 mm ; LP = 0.88 mm.
- j. *Agrodiaetus damone* close to ssp. *wagneri* FORSTER. Male. Turkey, Erzurum, Palandöken dagh, 2200 m, 5.viii. or 13/15.viii.1977.  
LV = 2.68 mm ; LL = 0.40 mm ; WL = 0.15 mm ; LP = 0.71 mm.
- k. *Agrodiaetus* sp., close to *tankeri* DE LESSE. Male. N. Iran, Azerbaidjan, Province Tabriz, 60 km NW of Tabriz, Vicinity of Dugijan, Dala dagh, 2800-2900 m, 25.vii.1979.  
LV = 2.02 mm ; LL = 2.02 mm ; LL = 0.45 mm ; WL = 0.17 mm ; LP = 0.70 mm.
- l. *Agrodiaetus tankeri* DE LESSE. Male. Turkey, Erzurum, Palandöken Mt., Ski Station, 2200-2500 m, 15/29.vii.1983.  
LV = 2.18 mm ; LL = 0.43 mm ; WL = 0.16 mm ; LP = 0.80 mm (Partly everted Vesica not taken into account).
- m. *Agrodiaetus iphigenia iphigenia* HERRICH-SCHÄFFER. Female. Turkey, Erzurum, Kargapazari daglari, vic. Zagki, 2100 m ; 3.vii.1978.
- n. *Agrodiaetus iphigenia nonacriensis* BROWN. Female. Greece, Mts of N. Peloponnissos, 1600 m, 3.vii.1984.
- o. *Agrodiaetus iphidamon* STAUDINGER. Female. NW Iran, Shahkuh. Coll. B.M.(N.H.).
- p. *Agrodiaetus iphigenides* STAUDINGER. Female. Turkestan, Kappak, Alexander Mts. 21/27.vii.1905. Coll. B.M.(N.H.).
- q. *Agrodiaetus damone sibirica* STAUDINGER. Female. Siberia, Ongodai, Altai Mts. 1898. Coll. B.M.(N.H.).

Example *k* in Figs. 2, 3, 4 & 6 are the genitalia belonging to a male specimen which I received from Germany, designated as *Agrodiaetus altivagans* ssp. nov. and recorded from Azerbaïdjan, N. Iran. This butterfly differs superficially from nominate *altivagans*, but bears certain affinities to specimens designated as such by DE LESSE (1962, 1963a) on the basis of their chromosome numbers and recorded, likewise, from N. Iran. Furthermore this specimen bears superficial similarities to *Agrodiaetus tankeri* DE LESSE 1960 and its genital characters come closer to those of *tankeri* (Figs. 2, 3, 4 & 6, example *l*) than to those of *altivagans*, in that its Labides, when viewed laterally, though blunter than those of *tankeri*, do, however, share with it a dorsal extension, a character which *altivagans* lacks. Perhaps what we have here is either a subspecies of *tankeri* or an example of a new species, ruling out conspecificity with *altivagans*.

The above examples show but a mere fraction of the confusion that exists in the classification of the blue members of the genus *Agrodiaetus* and reveal the urgent need for careful revisionary work that will also have to be based, at least in part, on a thorough study and recording of genital characters of the type material.

I am greatly indebted to the Department of Entomology of the British Museum (Natural History) and especially to Mr. P. R. ACKERY, for their kind and invaluable assistance.

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